

### REMARKS

These remarks and the accompanying amendments are responsive to the Office Action dated November 21, 2008 (hereinafter referred to as the "Office Action"). The applicants thank the Examiner for the courtesies extended during the in-person interview held Tuesday, May 12, 2009. At the time of the last examination, Claim(s) 5-10 were pending, of which Claim(s) 7 and 9 are independent. Since no claims are amended, cancelled, or added by this response, these claims remain pending for further consideration by the Examiner.

Section 3 of the Office Action rejects Claims 5-10 under 35 U.S.C. 103(a) as being unpatentable over United States patent number 5,914,959 issued to Marchetto et al. (the patent hereinafter referred to simply as "Marchetto") in view United States patent number 5,901,185 issued to Hassan (the patent hereinafter referred to simply as "Hassan"). This is the sole remaining rejection in the case. The applicants respectfully traverse the rejection, and request reconsideration of the rejection for at least the following reasons.

According to the applicable statute, a claimed invention is unpatentable for obviousness if the differences between it and the prior art "are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art." 35 U.S.C. § 103(a) (2005); *Graham v. John Deere Co.*, 383 U.S. 1, 14 (1966); MPEP 2142. Obviousness is a legal question based on underlying factual determinations including: (1) the scope and content of the prior art, including what that prior art teaches explicitly and inherently; (2) the level of ordinary skill in the prior art; (3) the differences between the claimed invention and the prior art; and (4) objective evidence of nonobviousness. *Graham*, 383 U.S. at 17-18; *In re Dembiczak*, 175 F.3d 994, 998 (Fed. Cir. 1999).

"The key to supporting any rejection under 35 U.S.C. 103 is the clear articulation of the reason(s) why the claimed invention would have been obvious." MPEP 2142 (2007). Analysis supporting a rejection under 35 U.S.C. §103(a) should be made explicit. *KSR Int'l Co. v. Teleflex, Inc.*, 127 S. Ct. 1727, (2007). Moreover, the Patent Office must identify a reason (such as motivation) why a person of ordinary skill in the art at the time of the invention would have combined the prior art elements in the manner claimed. *Id.* "[R]ejections on obviousness grounds cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness." *Id.* quoting *In re Kahn*, 441 F.3d 977, 988 (CA Fed. 2006); see also MPEP 2142. A court should be wary of reasoning based on hindsight. See *Graham*, 383 U.S. at 36.

It is the initial burden of the PTO to demonstrate a *prima facie* case of obviousness. If the PTO does not set forth a *prima facie* case of obviousness, the Applicants are under no obligation to submit evidence of nonobviousness. MPEP 2142 (emphasis added).

As acknowledged by the Examiner in the Office Action, Marchetto does not teach or suggest a signal generation means or step in which "a ratio of the number of pilot symbols to the total number of symbols in a single slot of the signal becomes smaller in a case where a transmission rate of the signal is high, than that in a case where the transmission rate is low" as recited in independent Claims 7 and 9. Hassan also does not teach this feature. Instead, Hassan teaches that if one increases the number of pilot symbols, a better bit-error-rate is achieved, but one should be careful in doing this can reduce the information carrying capacity of the channel. Thus, even if Marchetto and Hassan are combined, one does not arrive at a signal generation means or step in which "a ratio of the number of pilot symbols to the total number of symbols in a single slot of the signal becomes smaller in a case where a transmission rate of the signal is

high, than that in a case where the transmission rate is low" as recited in independent Claims 7 and 9.

Thus, there is a significant gap between the teachings of the combination of Marchetto and Hassan, even if combined, and the recitations of the pending claims. One of ordinary skill in the art in 1997 would simply not have thought to bridge this significant gap without some explicit suggestion that the gap be bridged, especially not based on the teachings of Hassan.

The Examiner indicates that Hassan is evidence that it was understood in 1997 that an engineer should determine the optimum ratio of pilot symbols to total symbols in designing a communication protocol (see Column 4, lines 48-58 of Hassan). The Examiner then uses hindsight reasoning to formulate a significant logical leap that one of ordinary skill in the art would thus try a smaller ratio of pilot symbols to information symbols for higher transmission rates. This significant logical leap is not justified based on the evidence of record.

The Examiner relies heavily on the "obvious to try" language of the recent *KSR v. Teleflex* decision decided by the U.S. Supreme Court in 2007 in making this assertion.

When there is a design need or market pressure to solve a problem and there are a finite number of identified, predictable solutions, a person of ordinary skill has good reason to pursue the known options within his or her technical grasp. If this leads to the anticipated success, it is likely the product not of innovation but of ordinary skill and common sense. In that instance the fact that a combination was obvious to try might show that it was obvious under §103. 127 S. Ct. 1727, 1742 (2007).

However, in the *KSR v. Teleflex* decision, almost immediately after indicating that the "obvious to try" standard has some effect, the United States Supreme Court cautions against the natural instincts of an Examiner to use hindsight reasoning when relying on this "obvious to try" standard. The United States Supreme Court's cautionary note is stated as follows:

A fact finder should be aware, of course, of the distortion caused by hindsight bias and must be cautious of arguments reliant upon ex post reasoning. See Graham, 383 U. S., at 36 (warning against a "temptation to read into the prior art the teachings of the invention in issue" and instructing courts to "guard against slipping into the use of hindsight") (quoting *Monroe Auto Equipment Co. v. Heckethorn Mfg. & Supply Co.*, 332 F. 2d 406, 412 (CA6 1964))). 127 S. Ct. 1727, 1742 (2007).

KSR does not stand for the proposition that every option for solving a problem would be obvious. Doing so would render every invention rejected under KSR using hindsight analysis, regardless of how much foresight, innovation, and ingenuity the invention required. Instead, KSR indicates that it would only be obvious to try an option for solving a problem if that option were one of a finite set of identifiable, predictable options for solving a known problem. That is, an option for solving a problem is obvious if it that option is within the technical grasp of one of ordinary skill in the art (at the time the invention is made) as predictably leading to fruitfully addressing the problem.

The United States Supreme Court was correct to caution against using hindsight reasoning to overbroadly apply the "obvious to try" standard of KSR. Applicants submit that hindsight is being used by the Examiner in this very case as a basis for inappropriately applying the "obvious to try" standard of KSR. The applicants respectfully submit that it is for circumstances such as this that the United States Supreme Court issued its cautionary note regarding the overbroad application of the "obvious to try" standard of KSR. To apply the "obvious to try" standard here approaches a technology-inhibiting practice of denying patent protection for any option for solving any problem, regardless of the ingenuity involved in inventing that option.

Here, hindsight reasoning should especially be guarded against because of the long time that has passed since the priority date of the present application. Here we are in 2009 trying to assess the level of skill of one of ordinary skill in the art 12 year ago in 1997, in a fast moving art. It would be difficult after 12 intervening years in a fast-moving technology area, for a fact-finder (such as an Examiner) not to be influenced by the things learned in the last 12 years when assessing the level of ordinary skill in the art in 1997. In situations such as this where there is such a high risk of hindsight reasoning, and in light of the United States Supreme Court's cautionary statement, the applicants respectfully submit that evidence of the level of ordinary skill in the art should be required before a prima facie case of obvious.

As a strong indicator of the Examiner's hindsight reasoning, the applicants respectfully point out that the practice of generating new communication protocols is very often well-documented. Such documentation typically defines all aspects of a new communication protocol, even trivial aspects. Therefore, if the use of a smaller ratio of pilot symbols for higher bit rates were truly obvious to try in 1997 and would lead to predictable and fruitful results, the option would have been tried, and thus there should be abundant documentation showing the same. The Examiner noted in the Examiner Interview that there are arts in which the state of the art is not well documented. For instance, the Examiner used the example of "technologies" regarding the use of playground equipment (how to swing in an elliptical pattern on a swing). Typically, children playing in the playground do not document their activities, and thus we might more easily rely on supposition and anecdotal evidence to identify a level of ordinary skill in the art of using a playground swing. However, that reasoning has no applicability here where all aspects of new communication protocols are almost always precisely documented down to almost every detail. Precise documentation in new communication protocols was also the

practice in 1997 and earlier. Thus, in the present case, documentary evidence should win the day, rather than having to resort to relying on abstract suppositions regarding what one might have known. However, despite a lengthy and thorough prosecution history, the Examiner has found no prior art documentation that expressly shows that it was known in 1997 or earlier to use a smaller ratio of pilot symbols at higher rates as compared to lower rates.

The options that were obvious to try in 1997 to improve channel performance were 1) increase transmission power, and 2) distribute the pilot symbols more evenly. Those options were identifiable and would predictably improve performance. However, the recited option of the claim would 1) not be identified as one of the finite set of options by one of ordinary skill in the art in 1997, and 2) even if it was identified, would not be thought of by one of ordinary skill to lead to a predictable and fruitful result in 1997. After all, one of ordinary skill in the art would be aware in 1997 that higher bit rates usually imply more channel sensitivity, which pilot symbols correct. How could one of ordinary skill in the art with an awareness of this concept be able to identify that the option of actually reducing the density of pilot symbols per information symbol for higher bit rates would actually result in anything fruitful? Thus, in properly assessing the level of skill of one of ordinary skill in the art in 1997, one of ordinary skill simply would not be able to bridge the huge gaps between the combination of Marchetto and Hassan, even if combined, and the recited claims. Therefore, a prima facie case for rejecting the claims under 35 U.S.C. 103 has not been made. Therefore, the 35 U.S.C. 103 rejection should be withdrawn.

Applicants respectfully note that the remarks herein do not constitute, nor are they intended to be, an exhaustive enumeration of the patentable distinctions between any cited references and the invention, example embodiments of which are set forth in the claims of this application. Rather, and in consideration of the fact that various factors make it impractical to

enumerate all the patentable distinctions between the invention and the cited art, as well as the fact that the Applicants have broad discretion in terms of the identification and consideration of the base(s) upon which the claims distinguish over the cited references, the distinctions identified and discussed herein are presented solely by way of example. Consistent with the foregoing, the discussion herein is not intended, and should not be construed, to prejudice or foreclose contemporaneous or future consideration by the Applicants, in this case or any other, of: additional or alternative distinctions between the invention and the cited references; and/or, the merits of additional or alternative arguments.

Applicants note as well that the remarks, or a lack of remarks, set forth herein are not intended to constitute, and should not be construed as, an acquiescence, on the part of the Applicants: as to the purported teachings or prior art status of the cited references; as to the characterization of the cited references advanced by the Office Action; or as to any other assertions, allegations or characterizations made by the Office Action at any time in this case. Applicants reserve the right to challenge the purported teachings and purported prior art status of the cited references at any appropriate time.

In the event that the Examiner finds remaining impediment to a prompt allowance of this application that may be clarified through a telephone interview, the Examiner is requested to contact the undersigned attorney.

Dated this 20<sup>th</sup> day of May, 2009.

Respectfully submitted,

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